
Subject: Contemplation on combined Sensitivity(long)

Posted by [dbeardsl](#) on Wed, 17 Apr 2002 19:41:46 GMT

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seems like the people here are a bit more technical than those at other forums, so here ya go. I've always been a bit mystified about how putting two speakers in parallel actually increases their efficiency. How could you actually change how efficient a linear motor is by changing the input. Anyway, I thought about it the other day. Wayne or others, please correct me if I'm wrong. Here's how I think it goes, hooking up two motors in parallel does NOT increase the efficiency of the system itself. Example: One nominal 8 ohm driver being driven at 1 Watt. Solving this simple system of equations (ohms law) you get: $(W=VI) \quad 1 = 2.83 * .354 (V=IR) \quad 2.83 = .354 * 8$ 1 Watt, 2.83V, .354A. If you connect two drivers in parallel you now have a 4 ohm device. Solving this simple system of equations (ohms law) you get: $(W=VI) \quad 1 = 2 * .5 (V=IR) \quad 2 = .5 * 4$ 1 Watt, 2V, .5A. Now you have 1 Watt flowing through two parallel motors. Meaning they both experience the whole 2V, but each gets half the current (thus producing half the sound output each). Totaling to still... 1 Watt. The Reason we always say that two drivers in parallel doubles the efficiency (+3db) is simple. At a constant preamplifier level, if you connect a second 8 ohm device in parallel (total of 4 ohms), roughly twice as much wattage will flow through the system (depending on amplifier design), giving you twice the output SEEMING like the system is twice as efficient. Though each driver still has the same efficiency, your output is now over a greater area, moving away from a point source type configuration ($1/R^2$ falloff rate) and getting closer to a plane (no falloff) or a line ($1/R$ falloff rate). When standing back a bit, this may increase apparent efficiency even more. Am I making something more complex than need be? This seems right, but is it?